In re Application of: Lior BAUSSI
Serial No.: 10/516,926
Filed: July 14, 2005
Office Action Mailing Date: October 5, 2006

Examiner: Marcos L. Torres
Group Art Unit: 2617
Attorney Docket: 37160
(prev.: 340/04299)

In the Claims:

1. (Currently amended) A direction finding system comprising:

at least one first hand holdable unit comprising circuitry and apparatus that provides conventional cell phone telephony and non-telephony circuitry that transmits a radio beacon signal; and

at least one second hand holdable unit having a display screen and comprising direction finding (DF) circuitry that receives a radio beacon (RB) signal transmitted by a given first unit of the at least one first unit and determines from the received radio beacon signal an azimuth angle for the location of the first unit;

wherein the controller generates a display on the display screen responsive to the azimuth angle that indicates a location of the given first unit, and wherein the at least one first and at least one second unit comprise non-telephony circuitry that enable the first and second units to exchange data over a non-telephony channel responsive to the display generated by the controller, which data enables communication with the given first unit via conventional cell phone telephony.

2. (Currently amended) A direction finding system according to claim ~~2~~ 1 wherein the direction finding circuitry comprises Watson-Watts direction finding circuitry.

3. (Original) A direction finding system according to claim 2 wherein for receiving RB signals the at least one second unit comprises a first antennae and a second antenna electrically connected to the Watson-Watts direction circuitry.

4. (Currently amended) A direction finding system according to claim 3 wherein a difference in signal attenuation between the electrical connections of the antennae to the Watson-Watts circuitry is less than ~~about~~ 0.3 dB.

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5. (Currently amended) A direction finding system according to claim 3 wherein a difference in signal attenuation between the electrical connections of the antennae to the Watson-Watts circuitry is less than ~~about~~ 0.2 dB.

6. (Currently amended) A direction finding system according to claim 3 wherein a difference in signal attenuation between the electrical connections of the antennae to the Watson-Watts circuitry is less than ~~about~~ 0.1 dB.

7. (Currently Amended) A direction finding system according to claim 3 wherein the antennae have an electrical length less than ~~about~~ one fifth the wavelength of a carrier wave of the radio beacon signal.

8. (Currently amended) A direction finding system according to claim ~~7~~ 3 wherein the antennae have an electrical length equal to ~~about~~ one sixth the wavelength of the carrier wave of the radio beacon signal.

9. (Currently Amended) A direction finding system according to claim 3 wherein the two antennae are spaced apart by a distance less than ~~about~~ one fifth of the carrier wavelength.

10. (Currently Amended) A direction finding system according to claim 3 wherein the two antennae are spaced apart by a distance equal to ~~about~~ one eighth of the carrier wavelength.

11. (Previously presented) A direction finding system according to claim 3 wherein the Watson-Watts circuitry determines the azimuth from a difference between amplitude and/or phase of the received RB signal at the antennae.

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12. (Currently Amended) A direction finding system according to claim ~~2~~ 1 wherein the at least one ~~first~~ second unit comprises circuitry and apparatus that provides conventional cell phone telephony.

13. (Original) A direction finding system according to claim 12 wherein the at least one first unit comprises a common antenna for transmitting RB signals and for cell phone telephony functions.

14. (Original) A direction finding system according to claim 13 wherein the at least one first unit comprises a switch controllable to selectably, electrically connect the common antenna to the radio beacon circuitry or the cell phone circuitry.

15. (Previously presented) A direction finding system according to claim 3 wherein the at least one second unit comprises circuitry and apparatus that provides conventional cell phone telephony.

16. (Original) A direction finding system according to claim 15 wherein the at least one second unit comprises a switch controllable to selectably, electrically connect the first antenna to the direction finding circuitry or the cell phone circuitry.

17. (Previously presented) A direction finding system according to claim 12 wherein the RB signals comprise a carrier wave and the at least one first unit and the at least one second unit comprise a filter that blocks electromagnetic energy at a frequency of the carrier wave from reaching the cell phone circuitry.

18. (Original) A direction finding system according to claim 1 wherein the at least one first unit comprises circuitry and apparatus that provides conventional cell phone telephony.

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19. (Previously presented) A direction finding system according to claim 1 wherein the at least one second unit comprises circuitry and apparatus that provides conventional cell phone telephony.

20. (Previously presented) A direction finding system according to claim 1 wherein the direction finding circuitry determines a range for the first unit of the at least one unit responsive to the received RB signal.

21. (Original) A direction finding system according to claim 20 wherein the direction finding circuitry determines a DC level of the RB signal.

22. (Original) A direction finding system according to claim 21 wherein the controller determines the range responsive to magnitude of the DC level.

23. (Previously presented) A direction finding system according to claim 20 wherein the controller generates the display responsive to the determined range.

24. (Cancelled)

25. (Currently amended) A direction finding system according to claim ~~24~~ 1 wherein a second unit of the at least one second unit transmits an interrogation signal over the non-telephony channel responsive to which a first unit of the at least one first unit that receives the interrogation signal transmits an RB signal.

26. (Currently amended) A direction finding system according to claim 25 wherein subsequent to transmitting the interrogation signal the second unit transmits at least one additional interrogation signal over the non-telephony channel.

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27. (Original) A direction finding system according to claim 26 wherein each of the at least one additional interrogation signal is transmitted following a delay period that begins after a last RB signal received by the second unit that is transmitted by the at least one first unit responsive to the preceding interrogation signal.

28. (Previously presented) A direction finding system according to claim 25 wherein each interrogation signal transmitted by the second unit comprises ID data specific to a user of the second unit.

29. (Original) A direction finding system according to claim 28 wherein each of the at least one first unit is programmable with preference data specific to a user of the first unit and if it receives an interrogation signal transmitted by the second unit it transmits an RB signal responsive thereto only if the ID data in the transmitted interrogation signal matches preference data with which it is programmed.

30. (Previously presented) A direction finding system according to claim 25 wherein the transmitting circuitry of each first unit transmits its RB signal following a predetermined delay period after receipt of an interrogation signal.

31. (Currently amended) A direction finding system according to claim 30 wherein the at least one first unit comprises at least two first units and wherein the predetermined delay period for each first unit is chosen from plurality of different delay periods so as to reduce a probability that any two of the first units that receive a same interrogation signal have a same delay period.

32. (Previously presented) A direction finding system according to claim 30 wherein the transmitting circuitry of the first unit dithers its predetermined delay period.

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33. (Previously presented) A direction finding system according to claim 1_wherein each first unit is programmable so that RB signals transmitted by the first unit comprises ID data specific to a user of the first unit.

34. (Original) A direction finding system according to claim 33 wherein each unit of the at least one second unit is controllable by its user to transmit a signal comprising ID data that it receives in an RB signal from a given first unit whose location is indicated in the display, which given first unit is selectable by the user from the display.

35. (Original) A direction finding system according to claim 34 wherein the second unit is programmable with preference data specific to the second unit's user and wherein the location of a first unit is indicated on the screen only if ID data in the RB signal received from the first unit matches preference data with which it is programmed.

36. (Previously presented) A direction finding system according to claim 1 wherein the display indicating a position of a first unit comprises an icon representing the first unit displayed against a background of a radar screen and wherein a location of the icon on the radar screen corresponds to a location of the first unit relative to the orientation of the second unit.

37. (Currently amended) A direction finding system according to claim ~~36~~ 1 wherein a first unit of the at least one first unit is programmable so that RB signals that it transmits comprises data encoding at least one visual cue characteristic of the user of the first unit.

38. (Original) A direction finding system according to claim 37 wherein the controller of the at least one second unit displays on the screen, in association with an icon

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representing a first unit, a visual cue of the at least one visual cue encoded in an RB signal it receives from the first unit.

39. (Currently Amended) A direction finding system according to claim 1 wherein the RB signals comprise a carrier wave having a frequency in a range from ~~about~~ 800 MHz to ~~about~~ 900 MHz.

40. (Currently Amended) A direction finding system according to claim 1 wherein a second unit of the at least one second unit has an effective maximum range less than or equal to ~~about~~ 200 meters for receiving an RB signal transmitted by a first unit that can be used to determine an azimuth for the first unit.

41. (Currently amended) A direction finding system according to claim 40 wherein the maximum range is less than or equal to ~~about~~ 100 meters.

42. (Currently amended) A direction finding system according to claim 41 wherein the maximum range is less than or equal to ~~about~~ 50 meters.

43. (Currently amended) A communication system comprising:

a plurality of cellular phones each of which comprises a display screen a GPS receiver that determines spatial coordinates for the phone's position and a transceiver for transmitting non-telephony signals;

wherein the transceiver of a first phone of the plurality of phones is controllable to transmit an interrogation signal responsive to which the transceiver of a second phone of the plurality of phones that receives the interrogation signal transmits a signal comprising GPS coordinates of the second phone and data that enables the first phone to establish conventional cell phone communication with the second phone; and

if the first phone receives the signal transmitted by the second phone, it displays a position icon responsive to the GPS coordinates on the first phone's screen that indicates a location of the second phone.

44. (Currently amended) A communication system according to claim 43 wherein each phone comprises a compass that generates signals responsive to a heading of an operator of the phone and wherein the second phone displays responsive to the compass signals, and together with the position icon, a heading icon indicating the heading of the second phone's operator.

45. (Original) A communication system according to claim 44 wherein the compass comprises a GPS compass.

46. (Previously presented) A communication system according to claim 44 wherein the compass comprises a magnetic compass.

47. (Previously presented) A direction finding system according to claim 2 wherein the at least one second unit comprises circuitry and apparatus that provides conventional cell phone telephony.

48. (New) A direction finding system according to claim 1 wherein the conventional cell phone circuitry and the DF circuitry share an antenna.

49. (New) A direction finding system according to claim 7 wherein the conventional cell phone circuitry and the DF circuitry comprised in the at least one second unit share an antenna.